# The Tired and The Blind. The effect of Cognitive Load Over Rule-Following Propensity and Social Norms

Masters Thesis Defense Presentation

Sebastián Ramírez

Advisors: Diego Aycinena and Silvia López-Guzman

October 24, 2022

# Motivation

- Social Norms are powerful predictors of behavior (Bicchieri and Xiao, 2009).
- Crucial role in cooperative relationships and coordinating groups (Gross and De Dreu, 2021)
- Cognitive load has been shown to be a psychological variable that has effects on different behaviors (Deck and Jahedi, 2015; Gerhardt et al., 2016a; Schulz et al., 2014).
- Characteristics of the context such as scarcity and time pressure can decrease the ability of the handling of cognitive load (Bogliacino and Montealegre, 2020; Mani et al., 2013).

What if the cognitive load influence the propensity of rulefollowing and the social norms perception.

- Lab experiment to examine the effect of cognitive load over Rule Following Propensity and Social Norms:
  - One exogenous manipulation.
  - Two incentivized tasks and one no incentivized task related to rule-following and social norms perception.

- Lab experiment to examine the effect of cognitive load over Rule Following Propensity and Social Norms:
  - One exogenous manipulation.
  - Two incentivized tasks and one no incentivized task related to rule-following and social norms perception.
- 213 participants.

- Lab experiment to examine the effect of cognitive load over Rule Following Propensity and Social Norms:
  - One exogenous manipulation.
  - Two incentivized tasks and one no incentivized task related to rule-following and social norms perception.
- 213 participants.

### **Results:**

- Subjects in the high cognitive load treatment tend to have more extreme behavior on rule-following
- We find a different composition of types of personal normative beliefs as a result of the high cognitive load condition.
  - Decrease in individuals with very strict (i.e. deontic) types and an increase with non'standard types of personal normative beliefs.

### Literature Review

## Cognitive Load

- Related to speed-accuracy trade-off (Hofmann et al., 2009).
- Evidence from cognitive load on different behaviors: trustworthiness (Schulz et al., 2014), prosociality(Achtziger et al., 2016; Benjamin et al., 2013), lying (Van 't Veer et al., 2014) and risky choice (Gerhardt et al., 2016b).

### Literature Review

### **Cognitive Load**

- Related to speed-accuracy trade-off (Hofmann et al., 2009).
- Evidence from cognitive load on different behaviors: trustworthiness (Schulz et al., 2014), prosociality(Achtziger et al., 2016; Benjamin et al., 2013), lying (Van 't Veer et al., 2014) and risky choice (Gerhardt et al., 2016b).

### Social Norms and Rule Following

- Experimental methods to evaluate social norms elicitation and related behavior (d'Adda et al., 2020; Krupka and Weber, 2013), rule following propensity (Kimbrough and Vostroknutov, 2016, 2018; Rössler et al., 2019) and social norms perception types (Aycinena et al., 2022).
- Research in variables affecting the social norms perception (Bašić and Verrina, 2021; Berger and Hevenstone, 2016; Bicchieri et al., 2022; Joao and Benno, 2012; Krysowski and Tremewan, 2020)

Motivation

References

#### Treatment Variable:

• The N-back task with two variations: 0 back (Low Cognitive Load) and 3 back (High Cognitive Load) (Kirchner, 1958).

#### Outcome Variables:

- The Rule-following propensity task
- The Krupka and Weber (2013) protocol to identify social norms (normative expectations) through coordination.
- Variation of the KW protocol to obtaining the personal normative beliefs.

### Control Variables:

- Ognitive Reflection Test. (Frederick, 2005)
- NASA-TLX (Hart, 2016).

### Cognitive Load Conditions



(a) LCL Condition (0-Back) (b) HCL Condition (3-Back)

Figure: 1. N-Back Task examples for each experimental condition

- 3 rounds, 60 trials in each one.
- A particular setup for the payments to enforce effort:
  - Initial Endowment of COP 20000 for the LCL.
  - Initial Endowment of COP 35000 for the HCL.

In both cases a penalization of COP 1000 per error.

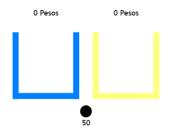


Figure: Rule Following Task

- Two buckets: Blue bucket (COP 100) and a Yellow bucket (COP 200).
- An explicit rule stating that "balls must be distributed in the blue bucket".

Motivation

### Social Norms Perception

 Vignette about the Roll Dice from Fischbacher and Föllmi-Heusi, 2013



- Normative Expectations Elicitation. Krupka & Weber (2013):
- Personal Normative Beliefs Elicitation.
- Evaluate, in 5 different situations, 20 possible choices that vary the extent of dishonesty for a given situation.

### Norm-Elicitation

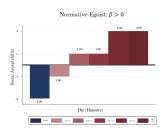
- Normative Expectations Elicitation.
  - -"'socially appropriate' and 'consistent with moral or proper social behaviour' or'socially inappropriate' and 'inconsistent with moral or proper social behaviour'"
  - -"By socially appropriate, we mean behaviour that most people agree is the 'correct' or 'ethical' thing to do"
  - Subjects are incentivized to match the modal responses of other participants (COP 10000)
- Personal Normative Beliefs Elicitation.
  - -" appropriate and 'consistent with moral or proper behaviour or inappropriate and 'inconsistent with moral or proper behaviour."
  - "By appropriate, we mean behaviour that you agree is the 'correct' or 'ethical' thing to do"
  - -Subjects reports their own beliefs about the behavior of the example with a fixed payment (COP 5000)

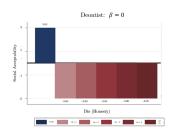
To classify individuals based on their perceived normative expectations and personal normative beliefs, we follow to Aycinena et al., 2022 that used the variation over the intensive margin.

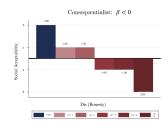
This allow them to estimate the following specification for each individual:

$$SA_{jis} = \alpha + \beta.Extent_j + \lambda.Situations_s + \delta.Truths_s + \varepsilon$$
 (1)

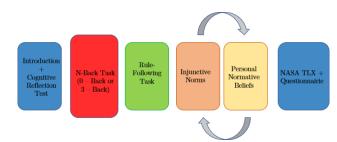
where  $SA_{jis}$  denotes the social acceptability of situation s (there are 5 situations referring to each possible outcome of a non-payoff maximizing die roll) and j denotes the extent of a lie in reporting an outcome.







# Experimental Design

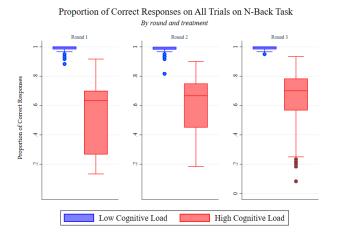


#### **Procedures**

- 13 sessions with 213 students from Universidad del Rosario between October 06 and November 29, 2021.
- Programmed in oTree (Chen et al., 2016).
- Recruited using ORSEE (Greiner, 2004).
- Time spent: 89 minutes, on average.
- Earnings: all earnings from N-Back, Rule-Following Propensity Task, the KW protocol and their variation.
   Average earnings COP 40.300 (COP 45100 for LCL and COP 35500 for HCL).

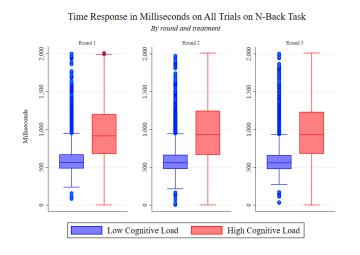
### Treatment effectiveness

Subjects on the High Cognitive Load Condition are more prone to commit errors and in the N-Back Task.



Wald Chi-2: D= 2484.15 P-value = 0.0000

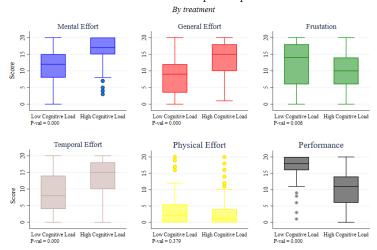
# Subjects on the High Cognitive Load Condition answer slower in the N-Back Task.



Wald Chi-2:  $D = 2209.72 \ P-value = 0.0000 \ \bigcirc$ 

### The NASA-TLX self-reports differ between conditions.

### NASA TLX Autoreport Responses





# Hypotheses

**Hypothesis 1 (H1)** Rule-following propensity will be lower in the HCL condition compared to the LCL condition.

**Hypothesis 2 (H2)** We expect for social norms perceived by the participants assigned to the HCL condition to be less severe.

## Model

$$Y_i = \beta_0 + \beta_1 HCLi + \beta_2 Female_i + \beta_3 CA_i + \beta_4 Econ_i + \epsilon_i$$

 $HCL_i$ : Cognitive Load treatment on subject i (1 is High Cognitive Load; 0 otherwise).

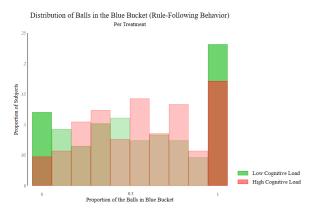
Female;: Gender (1 is Female; 0 otherwise).

CA<sub>i</sub>: Cognitive ability (From 1 to 3)

Econ; Econ related career (1 is Econ Related; 0 otherwise)

# Rule Following Propensity

**RESULT 1:** The Rule-Following Propensity Task show no differences on the distribution of balls between our two conditions



K-S: D= 0.1180 P-value = 0.449

# **RESULT 2:** The subjects on the HCL break less the norms completely (Full Rule-Violation)

Table: OLS and Probit on Rule Compliance

	(1)	(2)	(3)	(4)	(5)	(6)
	Rule-violation	Rule-violation	Complete Rule-following	Complete Rule-following	Complete Rule-violation	Complete Rule-violation
Treatment	2.039	1.379	-0.215	-0.202	-0.495*	-0.450*
	(2.331)	(2.343)	(0.197)	(0.198)	(0.262)	(0.269)
Is Female	, ,	-2.192	` /	0.162	` '	0.322
		(2.498)		(0.208)		(0.283)
Econ Related		-3.963		-0.215		0.346
		(2.475)		(0.205)		(0.273)
CRT-Normal Score		0.320		0.257		-0.0609
		(3.364)		(0.271)		(0.393)
Buckets Order		-2.151		-0.0956		0.0865
		(2.345)		(0.197)		(0.246)
Constant	27.38***	31.39***	-0.734***	-0.788***	-1.173***	-1.562***
	(1.753)	(2.680)	(0.133)	(0.223)	(0.157)	(0.312)
Observations	213	213	213	213	213	213
Sociodemograpic Controls		✓		✓		
R-squared	0.004	0.025	0.00558	0.0176	0.0305	0.0613

Probit Model on full rule-breaking and full rule-following. Sociodemographic controls includes age, gender, a dummy for those who study a career related to economics, the CRT Scores and a dummy if the Blue Bucket was presented on the left. Robust standard errors in parentheses \*\*\* p < 0.01, \*\* p < 0.05, \* p < 0.1

# **RESULT 3:** The subjects on the HCL condition show have less probability of incur on extreme behavior (Full Rule-Following or Full Rule-Violation)

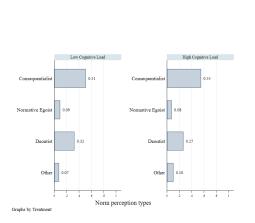
Table: OLS on the Extreme Rule Behavior

	(1)	(2)
	Extreme Values	Extreme Values
Treatment	-0.133**	-0.114*
	(0.0615)	(0.0620)
Is Female	, ,	0.0984
		(0.0659)
Econ Related		-0.00234
		(0.0646)
CRT-Cognitive Score		-0.0384
		(0.122)
Buckets Order		-0.00684
		(0.0628)
Constant	0.352***	0.407***
	(0.0462)	(0.127)
Observations	213	213
Sociodemograpic Controls		✓
R-squared	0.022	0.045

OLS on the Extreme Rule Behavior on the Rule-Following Behavior Task. The dependent variable is a dummy of 1 when there is 0 or 50 balls on the blue bucket and 0 otherwise Sociodemographic controls includes age, gender, a dummy for those who study a career related to economics, the CRT Scores and a dummy if the Blue Bucket was presented on the left. Robust standard errors in parentheses \*\*\* p < 0.01, \*\* p < 0.05, \* p < 0.1

# Social Norms Perception

Figure: Normative Expectations Classification



Perception of Normative Expectations for truthfull reporting and different extent of lying 33 --33 -Consequentialist Normative Egoist Deontist

Chi-2(3): D = 1.5114 P-value = 0.680

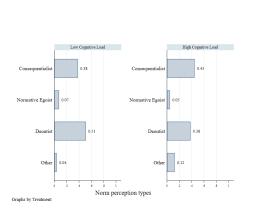
# **RESULT 4:** The perception of Normative Expectations shows no differences in our two conditions

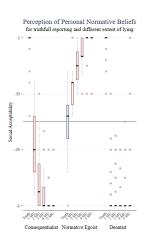
### Table: OLS on the Norm Perception Type (Normative Expectations)

0.0431 (0.0687)	0.0470 (0.0678) -0.156*** (0.0549)	0.0513 (0.0683) -0.148*** (0.0566)	-0.0574 (0.0627)	-0.0471 (0.0545)	-0.0419 (0.0551)	0.0307 (0.0393)	Other 0.0248	Other 0.0137
	(0.0678) -0.156***	(0.0683) -0.148***		(0.0545)				
(0.0007)	-0.156***	-0.148***	(0.0021)				(0.0350)	(0.0344)
	(0.0549)			-0.418***	-0.411***	(0.0393)	0.236***	0.222***
		0.0156 (0.0723)		(0.0427)	(0.0442) -0.00473 (0.0580)		(0.0510)	(0.0498) -0.0443 (0.0359)
		-0.0899 (0.0718)			0.113*			-0.0769** (0.0321)
		0.151			-0.0956			0.0359
		0.0230			-0.0536			(0.0483) 0.0407 (0.0353)
0.509*** (0.0483)	0.433*** (0.0505)	0.397*** (0.0754)	0.324*** (0.0452)	0.121*** (0.0372)	0.138** (0.0588)	0.0741*** (0.0253)	0.189*** (0.0429)	0.208*** (0.0496)
213	213	213	213	213	213	213	213	213
0.000	0.021	\checkmark	0.004	0.050	\checkmark	0.003	0.206	\checkmark 0.233
	(0.0483)	(0.0483) (0.0505) 213 213	0.151 (0.0963) 0.0230 (0.0685) 0.509*** 0.433*** 0.397** (0.0483) (0.0505) (0.0754) 213 213 213 213 \checkmark	0.151 (0.0963) 0.0230 (0.0685) 0.0230 (0.0685) 0.0509*** 0.433*** 0.397*** 0.324*** (0.0483) (0.0505) (0.0754) (0.0452) 213 213 213 213 checkmark	0.151 (0.0963) (0.0230 (0.0685) (0.0685) (0.0685) (0.06885) (0.06885) (0.06983) (0.0505) (0.0754) (0.0452) (0.0372) (0.0452) (0.0372) (0.0452) (0.0372)	0.151 - 0.0956 (0.0963) (0.0769) (0.0769) (0.0685) (0.0685) (0.0685) (0.0685) (0.0685) (0.0688) (0.0688) (0.0688) (0.0698) (0.0754) (0.0452) (0.0372) (0.0588) (0.0754) (0.0452) (0.0372) (0.0588) (0.0688) (0.0754) (0.0452) (0.0372) (0.0588) (0.068	0.151	0.151

This table shows results from OLS regressions on the Social Norms Valuation Types. We consider a set of *Sociodemographic controls* includes age, gender, and a dummy variable that takes value 1 for those who study a career related to economics and the Cognitive Reflection Test Scores. Robust standard errors in parentheses \*\*\* p < 0.01, \*\* p < 0.05, \* p < 0.1

### Figure: Personal Normative Beliefs Classification





Chi-2(3): D= 8.1939 P-value = 0.042

Motivation

# **RESULT 5:** There is a difference in the distribution of non-standard and Deontic subjects

### Table: OLS on the Norm Perception Type (Personal Normative Beliefs)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Consecuensialist	Consecuensialist	Consecuensialist	Deontist	Deontist	Deontist	Other	Other	Other
Treatment	0.0680	0.0756	0.0764	-0.128*	-0.0857	-0.0843	0.0868**	0.0615**	0.0643**
MSA	(0.0677)	(0.0679) -0.0847*	(0.0681) -0.0675	(0.0678)	(0.0590) -0.474***	(0.0597) -0.487***	(0.0371)	(0.0303) 0.281***	(0.0310) 0.281***
Is Female		(0.0504)	(0.0532) -0.0192 (0.0721)		(0.0397)	(0.0427) 0.0257 (0.0617)		(0.0545)	(0.0549) -0.0286 (0.0282)
Econ Related			0.116 (0.0736)			-0.0953 (0.0627)			0.0162 (0.0313)
CRT- Score			0.00176 (0.0943)			0.00759			0.0318
Order Effect			0.143**			-0.124** (0.0587)			-0.0284 (0.0306)
Constant	0.380*** (0.0469)	0.325*** (0.0553)	0.225*** (0.0721)	0.509*** (0.0483)	0.206*** (0.0443)	0.283*** (0.0629)	0.0370** (0.0183)	0.217*** (0.0481)	0.225*** (0.0548)
Observations	213	213	213	213	213	213	213	213	213
Demograpic Controls R-squared	0.005	0.013	√ 0.047	0.017	0.269	√ 0.293	0.026	0.324	√ 0.332

This table shows results from OLS regressions on the Social Norms Valuation Types. We consider a set of Sociode-mographic controls includes age, gender, a dummy variable that takes value 1 for those who study a career related to economics, and the Cognitive Reflection Test Scores. Robust standard errors in parentheses \*\*\*\* p < 0.01, \*\*\* p < 0.05, \* p < 0.1

### Conclusions

- Cognitive load affects the propensity to follow the rules on the extreme behaviors
- There is a negative effect on the full-rule breaking, although this last result is weak and just marginally significant.
- Cognitive load effect on the Other and Deontist norm perception in the Personal Normative Beliefs.
- We do not observe significant effects on the Normative Expectations.

# Thank you!

## References I



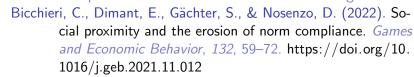
- Aycinena, D., Rentschler, L., Beranek, B., & Schulz, J. (2022). Social Norms and Dishonesty across Societies [Revised & Resubmmited]. Proceedings of the National Academy of Sciences (Revised and Resubmitted).
- Bašić, Z., & Verrina, E. (2021). Personal Norms and Not Only Social Norms — Shape Economic Behavior (SSRN Scholarly Paper No. 3720539). Social Science Research Network. Rochester, NY. https://doi.org/10.2139/ssrn. 3720539

## References II



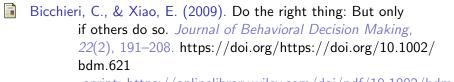
Berger, J., & Hevenstone, D. (2016). Norm enforcement in the city revisited: An international field experiment of altruistic punishment, norm maintenance, and broken windows. *Rationality and society*, 28(3), 299–319. https://doi.org/10.1177/1043463116634035

Accepted: 2017-06-12T09:31:55Z Publisher: Sage



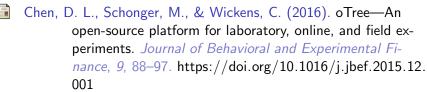
## References III

Motivation



\_eprint: https://onlinelibrary.wiley.com/doi/pdf/10.1002/bdm.621 Bogliacino, F., & Montealegre, F. (2020). Do Negative Economic Shocks Affect Cognitive Function, Adherence to Social Norms and Loss Aversion? (Tech. rep. y4zaw). Center for Open Science. Retrieved February 10, 2021, from https: //ideas.repec.org/p/osf/socarx/y4zaw.html Publication Title: SocArXiv

## References IV



- d'Adda, G., Dufwenberg, M., Passarelli, F., & Tabellini, G. (2020). Social norms with private values: Theory and experiments. Games and Economic Behavior, 124, 288–304. https://doi. org/10.1016/j.geb.2020.08.012
- Deck, C., & Jahedi, S. (2015). The effect of cognitive load on economic decision making: A survey and new experiments. European Economic Review, 78(100), 97-119. Retrieved August 19, 2019, from https://ideas.repec.org/a/eee/ eecrev/v78v2015icp97-119.html

- Fischbacher, U., & Föllmi-Heusi, F. (2013). Lies in Disguise—An Experimental Study on Cheating. *Journal of the European Economic Association*, 11(3), 525–547. https://doi.org/10.1111/jeea.12014
- Frederick, S. (2005). Cognitive Reflection and Decision Making.

  Journal of Economic Perspectives, 19(4), 25–42. https://doi.org/10.1257/089533005775196732
- Gerhardt, H., Biele, G. P., Heekeren, H. R., & Uhlig, H. (2016a).

  Cognitive load increases risk aversion (Working Paper
  No. 2016-011). SFB 649 Discussion Paper. Retrieved April
  19, 2022, from https://www.econstor.eu/handle/10419/
  146180

# References VI

- Gerhardt, H., Biele, G. P., Heekeren, H. R., & Uhlig, H. (2016b). Cognitive load increases risk aversion (SFB 649 Discussion Paper No. 2016-011). SFB 649, Economic Risk. Berlin. http://hdl.handle.net/10419/146180
- Greiner, B. (2004). An Online Recruitment System for Economic Experiments [Pages: 79-93 Volume: 63]. Retrieved May 3, 2022, from https://mpra.ub.uni-muenchen.de/13513/
- Gross, J., & De Dreu, C. K. W. (2021). Rule Following Mitigates Collaborative Cheating and Facilitates the Spreading of Honesty Within Groups [Publisher: SAGE Publications Inc]. Personality and Social Psychology Bulletin, 47(3), 395–409. https://doi.org/10.1177/0146167220927195

### References VII

Motivation



Hofmann, W., Friese, M., & Strack, F. (2009). Impulse and Self-Control From a Dual-Systems Perspective. Perspectives on Psychological Science, 4(2), 162–176. https://doi.org/10. 1111/j.1745-6924.2009.01116.x

Publisher: SAGE Publications Inc.

### References VIII

- Joao, R., & Benno, T. (2012). Are Academics Messy? Testing the Broken Windows Theory with a Field Experiment in the Work Environment [Publisher: De Gruyter]. Review of Law & Economics, 8(3), 563-577. Retrieved April 18, 2022, from https://ideas.repec.org/a/bpj/rlecon/v8y2012i3p563-577n7.html
- Kimbrough, E. O., & Vostroknutov, A. (2016). Norms Make Preferences Social. Journal of the European Economic Association, 14(3), 608-638. https://doi.org/10.1111/jeea.12152
- Kimbrough, E. O., & Vostroknutov, A. (2018). A portable method of eliciting respect for social norms. *Economics Letters*, 168, 147–150. https://doi.org/10.1016/j.econlet.2018.04. 030

# References IX

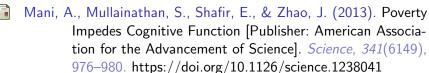
- Kirchner, W. K. (1958). Age differences in short-term retention of rapidly changing information [Place: US Publisher: American Psychological Association]. *Journal of Experimental Psychology*, *55*(4), 352–358. https://doi.org/10.1037/h0043688
- Krupka, E. L., & Weber, R. A. (2013). Identifying Social Norms Using Coordination Games: Why Does Dictator Game Sharing Vary? *Journal of the European Economic Association*, 11(3), 495–524. https://doi.org/10.1111/jeea.12006
- Krysowski, E., & Tremewan, J. (2020). Why Does Anonymity
  Make Us Misbehave: Different Norms or Less Compliance?

  Economic Inquiry, n/a(n/a). https://doi.org/https://doi.org/10.1111/ecin.12955

  \_eprint: https://onlinelibrary.wiley.com/doi/pdf/10.1111/ecin.129

## References X

Motivation



- Rössler, C., Rusch, H., & Friehe, T. (2019). Do norms make preferences social? Supporting evidence from the field. *Eco*nomics Letters, 183, 108569. https://doi.org/10.1016/j. econlet.2019.108569
  - Schulz, J. F., Fischbacher, U., Thöni, C., & Utikal, V. (2014). Affect and fairness: Dictator games under cognitive load. Journal of Economic Psychology, 41, 77–87. https://doi. org/10.1016/j.joep.2012.08.007

# References XI



Van 't Veer, A., Stel, M., & van Beest, I. (2014). Limited Capacity to Lie: Cognitive Load Interferes with Being Dishonest. (SSRN Scholarly Paper No. ID 2351377). Social Science Research Network. Rochester, NY. https://doi.org/10.2139/ssrn.2351377

# A.1 Sociodemographics

Table: Sociodemographic Variables Summary

	(1)	(2)	(3)	
	Low Cognitive	High Cognitive	Difference	
	Load	Load	Dillerence	
Is Female	0.537	0.429	0.108	
	(0.048)	(0.049)		
Age	21.222	21.267	-0.044	
	(0.228)	(0.209)		
Econ Related	0.472	0.371	0.101	
	(0.048)	(0.047)		
CRT Score (Raw Score)	0.420	0.333	0.086	
	(0.039)	(0.036)		
CRT Score (Intuitive)	0.685	0.778	-0.093	
	(0.043)	(0.038)		
Observations	108	105		

Notes: Column (3) presents the difference associated to a t-test performed to check balance between the subjects in the LCL condition and the HCL condition. P values \*\*\* p < 0.01, \*\* p < 0.05, \* p < 0.1

# A.2 NASA TLX - Reg

#### OLS on the NASA-TLX Scores

	(1) Overall Effort	(2) Mental Effort	(3) Performance	(4) Physical Effort	(5) Temporal Effort	(6) Frustation
Treatment	0.248***	0.230***	-0.351***	-0.0288	0.224***	-0.121***
	(0.0361)	(0.0328)	(0.0304)	(0.0327)	(0.0398)	(0.0433)
Constant	0.429***	0.582***	0.855***	0.191***	0.434***	0.598***
	(0.0257)	(0.0255)	(0.0174)	(0.0233)	(0.0278)	(0.0324)
Observations	213	213	213	213	213	213
R-squared	0.183	0.189	0.388	0.004	0.130	0.036

This table shows results from OLS regressions on the NASA-TLX self-reports. Robust standard errors in parentheses \*\*\* p <0.01, \*\* p <0.05, \* p <0.1



# **RESULT 1 & 2:** Subjects on the High Cognitive Load Condition are prone to commit more errors answer slower in the N-Back Task

Table: Analysis for Cognitive Load Treatment Effectiveness

	(1)	(2)	(3)	(4)
	(1) Correct		(3) Milliseconds	(4) Milliseconds
	Correct	Correct	Milliseconds	Milliseconds
Treatment	-0.437***	-0.432***	286.8***	282.5***
	(0.0177)	(0.0178)	(10.63)	(10.87)
Round = 2	, ,	-0.0020	, ,	-6.605
		(0.0054)		(16.07)
Round = 3		0.0026		(16.07)
		(0.0040)		(14.94)
$Tratamiento \times Round = 2$	0.0485**	0.048**	17.66	17.59
	(0.023)	(0.023)	(14.06)	(14.53)
Tratamiento x Round = 3	0.0850***	0.085***	21.63	22.35
	(0.0257)	(0.0257)	(15.20)	(15.57)
Is Female	, ,	-0.010***	` '	-12.28***
		(0.0033)		(4.735)
Econ Related		0.019***		11.88**
		(0.0034)		(4.889)
CRT- Normal Score		0.056***		-36.15***
		(0.0061)		(8.689)
Constant	0.987***	0.953***	594.4***	631.8***
	(0.0049)	(0.0056)	(2.498)	(13.25)
	(	(	(,	( /
Observations	33,478	33,478	33,478	33,478
Number of trials	180	180	180	180
Sociodemograpic Controls		✓		✓
R-squared	0.113	0.107	0.113	0.107

Panel Analysis on the proportion of correct responses on the N-Back Task. The dependent variable is the correctness of the Responses on the 180 Trials. Sociodemographic controls includes age, gender, a dummy for those who study a career related to economics, and the CRT Scores. Robust standard errors in parentheses \*\*\*\* p < 0.01, \*\*\* p < 0.05,

<sup>\*</sup> p <0.1

▶ Back

#### Robustness Checks

**RC 1:** The results about Rule-following are robust when we use the NASA Scores as Independent Variable

Table: OLS on the Rule Following Behavior (Robustness checks)

	(1)	(2)	(3)	(4)	(5)	(6)
	Complete Rule-following	Complete Rule-following	Complete Rule-violation	Complete Rule-violation	Extreme Behavior	Extreme Behavior
Overal Effort	-0.411	-0.343	-0.923*	-0.895*	-0.753*	-0.681*
	(0.421)	(0.420)	(0.523)	(0.533)	(0.401)	(0.400)
Mental Effort	-0.0976 (0.468)	-0.129 (0.482)	0.928 (0.598)	1.361** (0.605)	0.325 (0.442)	0.441 (0.456)
Is Female		0.173 (0.209)		0.392 (0.281)		0.308 (0.196)
Econ Related		-0.218 (0.211)		0.470* (0.259)		0.0222
CRT-Cognitive Score		0.218		-0.747		-0.150
Buckets Order		(0.380) -0.0798		(0.540) 0.189		(0.367) -0.00415
Constant	-0.548**	(0.202) -0.610	-1.547***	(0.260) -1.488**	-0.384	(0.190) -0.327
	(0.266)	(0.460)	(0.412)	(0.670)	(0.259)	(0.444)
Observations	213	213	213	213	213	213
Sociodemograpic Controls		✓		✓		✓
Pseudo R2	0.00896	0.0198	0.0259	0.102	0.0147	0.0355

This table shows results from OLS regressions on the Rule Compliance. We consider a set of Sociodemographic controls includes age, gender, a dummy variable that takes value 1 for those who study a career related to economics and, the Cognitive Reflection Test Scores. Robust standard errors in parentheses \*\*\* p <0.01, \*\* p <0.05, \* p <0.1



**RC 2:** The results about the beliefs of Normative Expections are robust when we use the NASA Scores as Independent Variable

#### Table: OLS on the Social Norms Perception(Robustness checks)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Consecuensialist	Consecuensialist	Consecuensialist	Deontist	Deontist	Deontist	Other	Other
Overall Effort	0.0650	0.0741	0.0677	-0.229	0.174	-0.167	0.0669	0.0343
Overall Effort					-0.174			
	(0.148)	(0.148)	(0.147)	(0.152)	(0.136)	(0.135)	(0.0855)	(0.0645)
General Effort	-0.0508	-0.0549	-0.0161	0.151	0.126	0.0971	0.0324	0.0471
	(0.159)	(0.159)	(0.159)	(0.169)	(0.150)	(0.149)	(0.0920)	(0.0711)
MSA		-0.0801	-0.0635		-0.478***	-0.490***		0.285***
		(0.0501)	(0.0530)		(0.0387)	(0.0417)		(0.0553)
Is Female			-0.0229			0.0278		
			(0.0724)			(0.0619)		
Econ Related			0.111			-0.0876		
			(0.0750)			(0.0632)		
CRT-Cognitive Score			0.00312			0.00252		
			(0.0977)			(0.0825)		
Order Effect			0.148**			-0.129**		
			(0.0676)			(0.0585)		
Constant	0.413***	0.363***	0.240**	0.467***	0.169*	0.264**	0.0204	0.198***
	(0.0957)	(0.0981)	(0.121)	(0.0981)	(0.0876)	(0.109)	(0.0413)	(0.0610)
Observations	213	213	213	213	213	213	213	213
Sociodemograpic Controls			1			1		
R-squared	0.001	0.008	0.042	0.011	0.268	0.292	0.009	0.317

This table shows results from OLS regressions on the Social Norms Valuation Types. We consider a set of *Sociode-mographic controls* includes age, gender, and a dummy variable that takes value 1 for those who study a career related to economics and the Cognitive Reflection Test Scores. Robust standard errors in parentheses \*\*\*\* p < 0.01,

<sup>\*\*</sup> p <0.05, \* p <0.1



#### A.3 NASA-TLX

Por favor, responda a las siguientes preguntas basándose en su experiencia durante la tarea de memorización; en este cuestionario, 0 significa poco y 20 significa mucho.

- ¿Cuánta actividad mental y perceptiva fue necesaria (por ejemplo, decidir, calcular, recordar, mirar, buscar, etc.)? Donde 0 es muy poca actividad mental y 20 es mucha actividad mental.
- ¿Cuánto tuvo que trabajar para alcanzar su nivel de rendimiento? Donde 0 es que tuvo que trabajar poco y 20 es que trabajó mucho.
- ¿Qué tan inseguro se sintió durante la tarea? Donde 0 es muy inseguro y 20 es muy seguro.
- ¿Cuánta presión de tiempo sintió debido al ritmo al que se desarrollaron las tareas o los elementos de la tarea? Donde 0 es poca presión y 20 es mucha presión.
- ¿Cuánta actividad física fue necesaria (por ejemplo, empujar, tirar, girar, controlar, activar, etc.)? Donde 0 es que se requirió poca actividad física y 20 es que se requirió mucha actividad física.
- ¿Cúal cree que fue su rendimiento respecto al objetivo de la tarea?
   Donde 0 es un rendimiento pobre y 20 es un buen rendimiento.





Specifically, each individual is classified into types according to the following criteria:

- Consequentialist type if  $\beta < 0$  (significant at least at the 10% level), and the MSA of reporting a lie is lower than the MSA of reporting the truth while the mean social acceptability of reporting a lie is negative.
- Deontist type if  $\beta=0$  (or not significantly different from zero at the 10% level), the MSA of reporting the truth is greater zero, while the MSA of reporting a lie is negative.
- Normative Egoist type if  $\beta>0$  (significant at least at the 10% level) or  $\beta=0$  and the MSA of reporting a lie is greater than the MSA of reporting the truth.



Table: OLS on the Treatment

	(1)	(2)	(3)	(4)	(5)	(6)
	Treatment	Treatment	Treatment	Treatment	Treatment	Treatment
C	0.0557	0.00460			0.0446	0.0546
Consequentialist type (EN)	-0.0657	-0.00468			-0.0116	0.0516
	(0.124)	(0.125)			(0.127)	(0.130)
Deontological type (EN)	-0.135	-0.0607			-0.0477	0.0321
	(0.131)	(0.134)			(0.135)	(0.142)
Normative Egoist type (EN)	-0.135	-0.116			-0.0406	-0.00930
	(0.164)	(0.166)			(0.200)	(0.214)
Is Female		-0.0708		-0.0539		-0.0547
		(0.0741)		(0.0732)		(0.0740)
Econ Related		-0.0563		-0.0826		-0.0802
		(0.0756)		(0.0722)		(0.0767)
CRT Score		-0.102		-0.0872		-0.0943
		(0.0976)		(0.0953)		(0.0974)
Orden		0.00450		0.00443		0.00500
orden.		(0.00700)		(0.00692)		(0.00708)
Consequentialist type (PNB)		(0.00700)	-0.231**	-0.213*	-0.233*	-0.236*
consequentianse type (1 14b)			(0.117)	(0.122)	(0.119)	(0.124)
Deontological type (PNB)			-0.344***	-0.321***	-0.334***	-0.337***
Deontological type (FNB)			(0.116)	(0.120)	(0.119)	(0.123)
Normative Egoist type (PNB)			-0.380**	-0.410**	-0.365	-0.382
Normative Egoist type (FNB)			(0.171)	(0.170)		
Constant	0.579***	0.598***	0.765***		(0.224)	(0.233)
Constant				0.821***	0.784***	0.799***
	(0.114)	(0.124)	(0.104)	(0.112)	(0.137)	(0.135)
Observations	213	213	213	213	213	213
Sociodemograpic Controls		×		×		×
R-squared	0.007	0.030	0.038	0.062	0.040	0.063

This table shows results from OLS regressions on Treatment Variable. We consider a set of *Sociodemographic controls* includes age, gender, and a dummy variable that takes value 1 for those who study a career related to economics and the Cognitive Reflection Test Scores. Robust standard errors in parentheses \*\*\* p < 0.01, \*\* p < 0.05, \* p < 0.1